HCT CO., LTD.
Calibration & Certification Division
SAN 136-1, AMI-RI , BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA
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CERTIFICATE OF COMPLIANCE

Applicant Name:

PASSTECH CO., LTD.
#1305 Kranz Techno, 5442-1, Sangdaewon-dong,
Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-120, Korea

FRN: 0018558270

Date of Testing:
March 05, 2009

Test Site/Location:
HCT CO., LTD., San 136-1 Ami-ri, Bubal-eup, Icheon-si,
Kyungki-do, Korea
HCT FRN: 0005866421

FCC ID	:	**W6YZP-100**
APPLICANT	:	**PASSTECH CO., LTD.**

FCC Classification	:	Low Power Communication Device – Transmitter
EUT Type	:	RFID LOCKER LOCK
Manufacturer	:	PASSTECH CO., LTD.
Model name	:	ZP-100
Additional model name(s)	:	2154
Frequency of Operation	:	13.56 MHz
FCC Rule Part(s)	:	FCC Part 15.225 Subpart C
Test Procedure(s)	:	ANSI C-63.4-2003
Application Type	:	Original Equipment
Data of issue	:	March 05, 2009

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of FCC Part 15 Subpart C of the FCC Rules under normal use and maintenance.

Hyo Sun Kwak
Report prepared by
: Hyo Sun Kwak
Test engineer of RF Part

Sang Jun Lee
Approved by
: Sang Jun Lee
Manager of RF Part

C O N T E N T S

1. GENERAL INFORMATION

1-1. CLIENT INFORMATION

Company	**PASSTECH CO., LTD.**
Contact Point	**#1305 Kranz Techno, 5442-1, Sangdaewon-dong, Jungwon-gu, Seongnam-si, Gyeonggi-do, 462-120, Korea**
Contact person	**Name: Insoo, Kang** **Tel: + 82 31 743 7277** **Fax: + 82 31 743 7276**

1-2. **Description of Equipment Under Test**

Equipment Under Test			
Description	Manufacturer	Model Name	Additional model name
RFID LOCKER LOCK (RFID Device)	PASSTECH CO., LTD.	ZP-100	2154

2. TEST SPECIFICATIONS

2.1 Standards

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance With **FCC Part 15.Subpart C**

Regulation	Measurement standard	Range
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(a)	ANSI C63.4:2003	13.553MHz to 13.567MHz
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(d)	ANSI C63.4:2003	outside of the 13.110-14.010 MHz band
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.209	ANSI C63.4:2003	9kHz to 30MHz
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.209	ANSI C63.4:2003	30MHz to 1GHz
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.207	ANSI C63.4:2003	150kHz to 30MHz
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(e)	ANSI C63.4:2003	0.01% of nominal
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.215(c)	ANSI C63.4:2003	-

3. STANDARDS ENVIRONMENTAL TEST CONDITIONS

Temperature :	**+ 15 ℃ to + 35 ℃**
Relative humidity:	**30 % to 60 %**
Air pressure	**860 mbar to 1060 mbar**

4. TEST SUMMARY

The results in this report apply only to sample tested

Regulation	Test Type	Range	Result
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(a)	Radiated Electric Field Emissions	13.553MHz to 13.567MHz	Pass
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(b)	Radiated Electric Field Emissions	13.410MHz to 13.553MHz and 13.567MHz to 13.710MHz	N/A
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(c)	Radiated Electric Field Emissions	13.710MHz to 14.010MHz	N/A
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.209 (d)	Radiated Electric Field Emissions	9kHz to 30MHz	Pass
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.209	Radiated Electric Field Emissions	30MHz to 1GHz	Pass
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.207	AC power conducted emissions	150kHz to 30MHz	N/A
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.225(e)	Frequency Stability	0.01% of nominal	Pass
Title 47 of the CFR:2005, Part 15 Subpart (c), Clause 15.215(c)	20 dB Bandwidth	-	Pass

5. TEST EQUIPMENT

Manufacturer	Model / Equipment	Cal Interval	Calibration Due	Serial No.
Rohde & Schwarz	ESH2-Z5/ LISN	Annual	04/20/2009	861741/013
Rohde & Schwarz	ESH3-Z6/ LISN	Annual	03/19/2009	100329
Schwarzbeck	VULB 9160/ TRILOG Antenna	Biennial	04/20/2009	9160-3150
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
Rohde & Schwarz	ESH3-Z2/ PULSE LIMITER	Annual	10/30/2009	375.8810.352
MITEQ	AMF-60-0010 1800-35-20P	Annual	05/20/2009	1200937
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	03/26/2010	147
Schwarzbeck	BBHA9170/ SHF-EHF Horn Antenna	Biennial	03/20/2009	BBHA9170342
Rohde & Schwarz	6502/Loop Antenna	Biennial	12/26/2009	9009-2536
Rohde & Schwarz	FSP30/Spectrum Analyzer	Annual	07/31/2009	839117/011
Agilent	E4416A /Power Meter	Annual	01/21/2010	GB41291412
Wainwright Instrument	WHF3.3/18G-10EF / High Pass Filter	Annual	06/28/2009	1
Hewlett Packard	11636B/Power Divider	Annual	12/24/2009	11377
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	01/07/2010	3110117

6. Radiated Emission Measurement

Requirement(s): 15.209, 15.225

Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Minimum Standard: FCC Part 15.225 / 15.209

Rule Part	Frequency (MHz)	Limit
Part 15. 209	0.009 ~ 0.490	2400/F(KHz)uV/m@300
	0.490 ~1.705	24000/F(KHz)uV/m@30
	1.705 ~ 30	30 uV/m@30
	30 ~ 88	100 ** uV/m@3m
	88 ~ 216	150 ** uV/m@3m
	216 ~ 960	200 ** uV/m@3m
	Above 960	500 uV/m@3m

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

15.225 Operation within the band 13.110 – 14.010 MHz.

(a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter (= 84 dBuV/m) at 30 meters.

(b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter (=50.5dBuV/m) at 30 meters.

(c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter (=40.5 dBuV/m) at 30 meters.

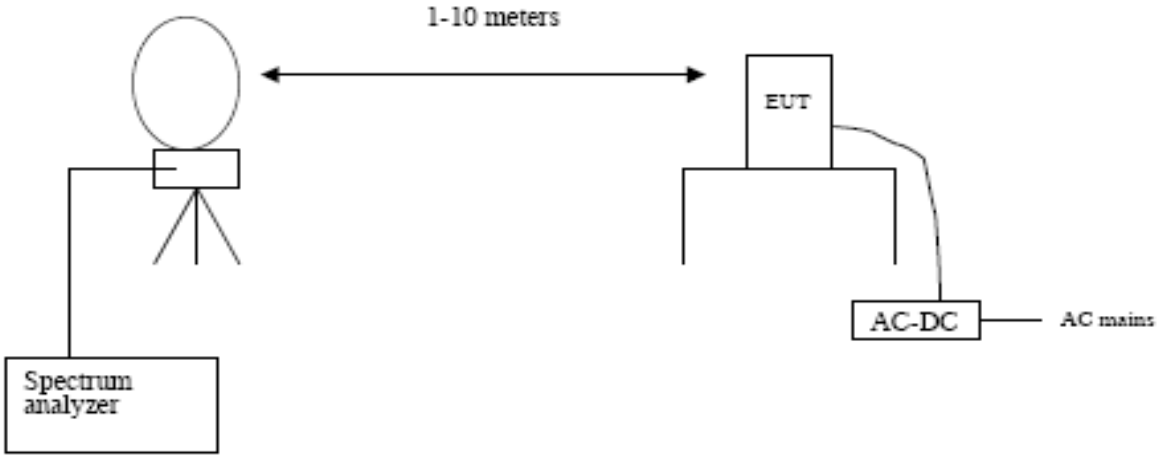
(d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

(e) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

(f) In the case of radio frequency powered tags designed to operate with a device authorized under this section, the tag may be approved with the device or be considered as a separate device subject to its own authorization. Powered tags approved with a device under a single application shall be labeled with the same identification number as the device.

6-1. Radiated Emission 9KHz – 30 MHz

Test Set-up



Test Procedure

The EUT was placed on a non-conductive table located on a large open test site.
The loop antenna was placed at a location 10m from the EUT. Radiated emissions were measured with the loop antenna both parallel and perpendicular to the plane of the EUT loop antenna.

The limit is converted from microvolts/meter to decibel microvolts/meter. Sample Calculation:

Corrected Amplitude = Raw Amplitude(dBμV/m) + ACF(dB) + Cable Loss(dB) – Distance Correction Factor

The spectrum analyzer is set to:
Frequency Range = 9 KHz ~ 1GHz
RBW = 9 KHz (9 KHz ~ 30MHz)
= 120 kHz (30 MHz ~ 1 GHz)

Trace Mode = max hold
Detector Mode = peak / Quasi-peak
Sweep time = auto

Test Results

13.553-13.567 MHz						
Frequency (MHz)	Read Level (dBuV)@3m	Factor (dB)	Distance Correction (dB)	Result Level (dBuV)@30m	Limit (dBuV)@30m	Margin (dB)
13.5634	35.84	9.91	-40	5.75	84	78.25

9KHz - 14.010 MHz						
Frequency (MHz)	Read Level (dBuV)@3m	Factor (dB)	Distance Correction (dB)	Result Level (dBuV)@30m	Limit (dBuV)@30m	Margin (dB)
8.58	14.38	10.21	-40	-15.41	29.5	44.91

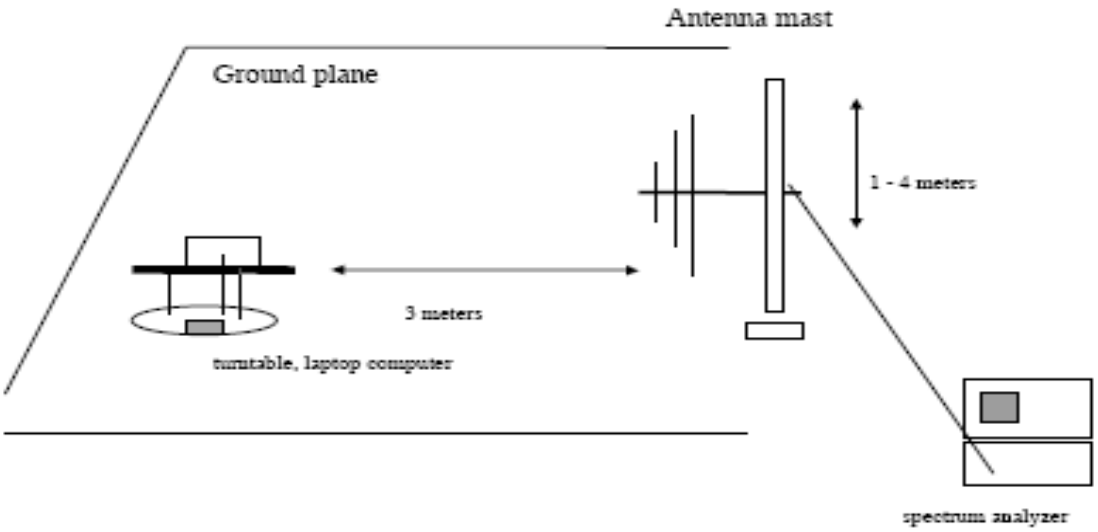
14.010 - 30 MHz						
Frequency (MHz)	Read Level (dBuV)@3m	Factor (dB)	Distance Correction (dB)	Result Level (dBuV)@30m	Limit (dBuV)@30m	Margin (dB)
27.28	10.96	7.91	-40	-21.07	29.5	50.57

Remark :

1. Distance Correction Below 30MHz = 40log(3m/30m) = - 40 dB
   Measurement Distance : 3 m (Below 30MHz)
2. Factor = Antenna Factor + Cable Loss
3. Result Level = Read Level + Factor + Distance Correction
4. Margin = Limit – Result Level

6-2. Radiated Emission 30 MHz – 1000 MHz

Test Set-up



Test Procedures: Radiated emissions were measured according to ANSI C63.4.
The EUT was set to transmit at the highest output power.
The EUT was set 3 meter away from the measuring antenna.

Frequency	Read Level	Factor	ANT POL	Result Level	Limit	Margin
MHz	dBuV	dB	(H/V)	dBuV/m	dBuV/m	dB
246	15.7	14.9	H	30.6	46.0	-15.4
273	14.9	16.0	H	30.9	46.0	-15.1
299	15.0	17.0	H	32.0	46.0	-14.0
326	16.8	17.8	H	34.6	46.0	-11.4
353	11.9	18.6	H	30.5	46.0	-15.5
707	13.3	26.7	V	40.0	46.0	-6.0

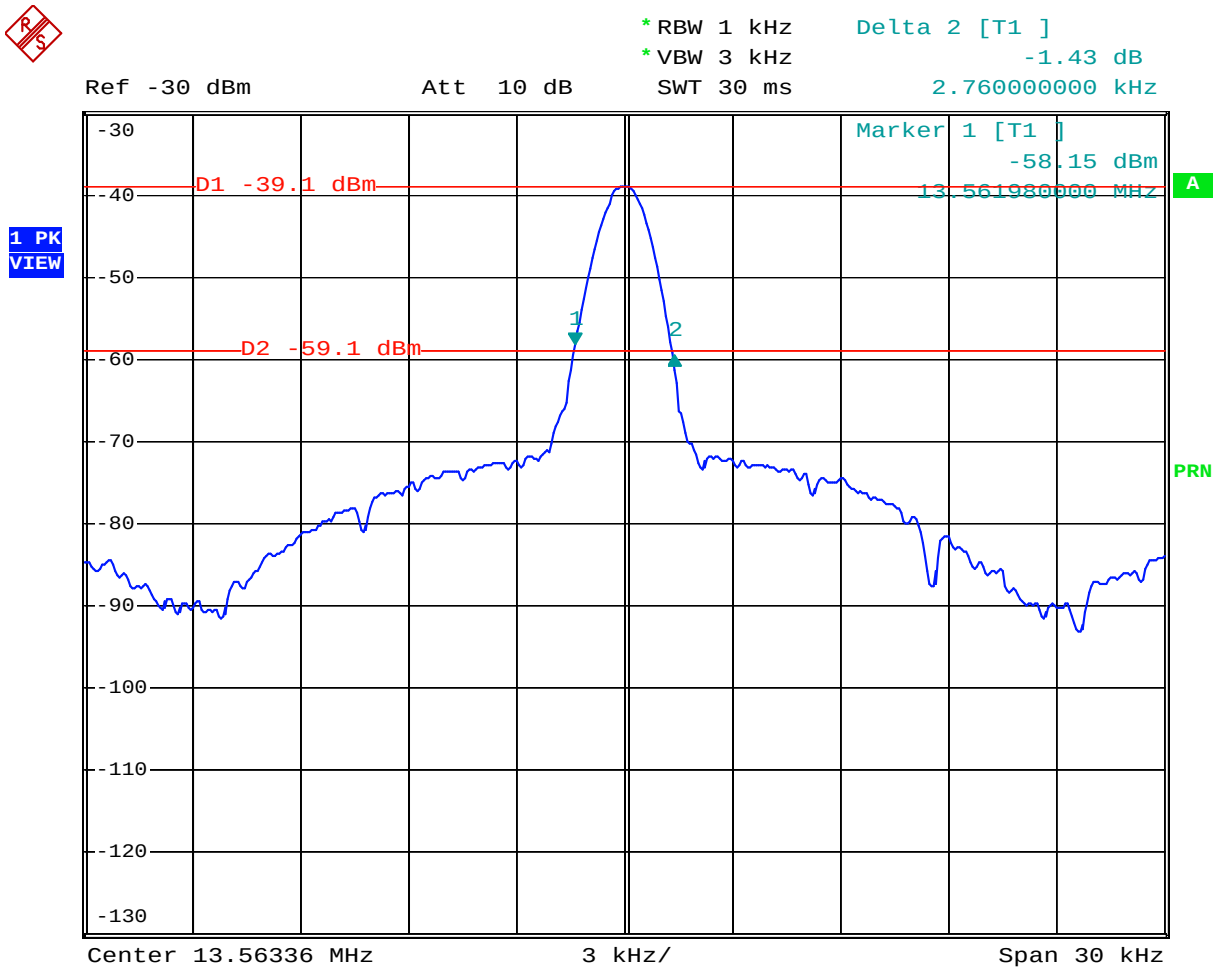
Remark :
1. Factor = Antenna Factor + Cable Loss
2. Result Level = Read Level + Factor
3. Margin = Limit – Result Level

7. Emission Bandwidth Plot.

Requirement(s):

Test Set-up: The EUT **was connected to a spectrum analyzer.**

Test Procedure: The 20dB bandwidth was measured by using a spectrum analyzer.



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8. Frequency Tolerance

Procedure: Part 15.225, ANSI 63.4

If required, the operating or transmitting frequency of an intentional radiator should be measured in accordance with the following procedure to ensure that the device operates outside certain precluded frequency bands and within the frequency range. No modulation needs to be supplied to the intentional radiator during these tests, unless modulation is required to produce an output, e.g., single-sideband suppressed carrier transmitters.

The frequency stability of the transmitter is measured by:

a) Temperature: The temperature is varied from -20°C to + 50°C using an environmental chamber.

b) For battery operated equipment, the equipment tests shall be performed using a new battery.

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency.

Measurement Result:

VOLTAGE (%)	POWER	Temperature (°C)	Frequency (MHz)	Deviation (ppm)
100%	6 V	-20	13.563365	0.000029
100%		-10	13.563396	0.000060
100%		0	13.563397	0.000061
100%		10	13.563369	0.000033
100%		20	13.563336	0.000000
100%		30	13.563305	-0.000031
100%		40	13.563305	-0.000031
100%		50	13.563329	-0.000007

Notes:

1. The EUT is supplied with the fully re-charged battery.